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ABSTRACT

Speakers of languages without a surface case system tend, when learning German, to place predicate nominals erroneously in the accusative case when the verb is passive or the sentence governs a passive rather than an active situation. Three hypotheses are offered to explain this phenomenon: (1) the learner carries over the deep structure relations of active sentences into passive contexts; (2) the sentence position (final) at which the incorrect accusative occurs is identified by the learner as always requiring an accusative; and (3) the incorrect application of the accusative is both restricted to passive sentences and in particular to final position, i.e., case markings in final position tend to be determined exclusively on the basis of the deep structure "action + patient." Dutch and American university students were asked to make grammatical acceptability judgments on German sentences. An analysis of the results verifies hypothesis 3 against hypothesis 2. In a second experiment, the same students were asked to judge whether the determiners in a series of sentences were correct. An analysis of the results verifies hypothesis 3 against hypothesis 1. (JB)

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CASE ERRORS IN GERMAN AS A FOREIGN LANGUAGE

An Experimental Examination of a Hypothesis Based on a Psycholinguistic Model of Sentence Production

Peter Jordens

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Introduction

In search of the reasons why learners of a second language make specific errors, one normally looks for an explanation which is describably within a theory of second language learning. Furthermore, a linguistic description of contrasts between the native language (L_1) and the target language (L_2) is viewed as being an important aspect of this theory. In the following I will try to show that an understanding of the nature of the language production mechanism is a necessary prerequisite in order to give an adequate explanation of certain L_2-errors. This seems to be obvious because language utterances - utterances with L_2 errors as well - are the result of a language production mechanism that functions in a particular manner. It should be pointed out that if certain L_2 errors can only be explained within a theory of language production this also might be true for a theory of language perception. However, this does not imply that language perception is the same as or a reflection of language production.

Hypotheses and Testpossibilities

It can be assumed that speakers of an L_1 without surface case system, for example English or Dutch, who want to learn an L_2 in which on a surface structure level different case markings have to be applied, for example German will have difficulty in applying these cases correctly, This assumption based on a contrast between L_1 and L_2 is fairly general, however. It has been frequently observed that Dutch university students of German who can be regarded as advanced learners of German often make case errors specifically in passive sentences.

Some informal written examples of L_2 = German were collected from these Dutch university students. The following examples are taken from written exams and theses in which formal correctness did not play a role in marking. +)

+ Beim normalen Atmen wird keinen Geräusch erzeugt und auch keinen Laut
+ Es wird damit den Unterschied zwischen den Wörtern vereisen und verreisen angedeutet.

For these students, the application of the German case system in active sentences presented few problems. However, sentence constructions with sich lassen, that are semantically related to passive constructions presented difficulties. For example,

+ FÜr die zweite Variante lässt sich einen ähnlichen Vergleich aufstellen.

From my point of view, there are theoretically only three possible explanations for these errors. These explanations are regarded as theoretically possible

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rules underlying the sentence production process of L_2 (=German)-speakers.*

Hypotheses I.

A possible explanation would be that case markings in passive sentences can take place on the basis of deep structure relations as they are expressed in active sentences. In the surface structure of an active sentence the object (patient) of an action has the accusative case. An L_2-speaker of German who relies on this deep structure relation in applying the case marking rules will produce correct active sentences. His passive sentences, on the other hand, will contain errors for all the instances which involve an object (patient) at the deep structure level. (For more examples, see Appendix A). According to such a hypothesis, his case marking rules can be described in the following way: different word orders are described separately (in Ia and Ib) to allow a comparison between this explanation and the other possibilities that will be handled later on.

I.a. $X + V \begin{matrix}\text{act}\\\text{pass}\end{matrix} + NP\ (\text{patient}) \text{ ---- } X + V \begin{matrix}\text{act}\\\text{pass}\end{matrix} + NP\ (\text{acc})$

b. $NP\ (\text{patient}) + V \begin{matrix}\text{act}\\\text{pass}\end{matrix} + X \text{ --- } NP\ (\text{acc}) + V \begin{matrix}\text{act}\\\text{pass}\end{matrix} + X$

If hypothesis I is true sentences of the following types can be expected.

Gestern besuchte er meinen Bruder (active) Ia
Meinen Bruder besuchte er gestern (active) Ib
\+ Gestern wurder meinen Bruder besucht (passive) Ia
\+ Meinen Bruder wurder gestern besucht (passive) Ib

This means that in passive sentences the patient is a candidate for an incorrect case marking (accusative) whether its position is at the beginning of the sentence or at the end. However, this hypothesis - although theoretically possible - does not seem to capture the facts. In the error collection mentioned above (errors produced in non-guided written material) errors of the last type, i.e. incorrect accusative in the initial part of the passive sentence, rarely occurred. For some reason or another these case errors are more likely to occur in sentence final position. It also seems to be the case that these case errors in passive sentences are much more difficult to detect for correctors when they appear at the end of the sentence compared to their position at the beginning of the sentence.

Hypotheses II.

Another possible explanation will take into account the last mentioned observation, in which the incorrect use of the accusative case in German is more likely to be found in final position of any sentence. This explanation is based on the fact that in active main and subordinate clauses the position at the end of the sentence is normally (i.e. in unmarked sentences) reserved for an accusative NP. The final part can simply be defined as the final position

* It seems to me that a description of L_2-behavior in terms of underlying rules is superior to a classification of errors as interference, (over)-generalization, simplification errors etc. A description in terms of underlying rules which claim to have psycholinguistic reality makes any classification of errors superfluous.

or the position immediately before the infinite verb form (s) at the end of the sentence. For example,

Er besucht meinen Freund
Ich erwarte, dass er meinen Freund besucht

The nominative NP occurs in the initial position of the sentence.
It is clear that a hypothesis based on this principle is not only applicable to passive sentences but to all sentences in which an NP is located at the end of the sentence, whatever function this NP might have in the deep structure possibilities. The application of an incorrect accusative case depends on whether or not it is preceded by an NP (nominative) in the initial part of the sentence. The hypothetical rules can be described as follows:

II. a. $X + V \begin{matrix} act \\ pass \end{matrix} + NP$ ----- $X + V \begin{matrix} act \\ pass \end{matrix} + NP$ (acc)

b. $NP_1 + V \begin{matrix} act \\ pass \end{matrix} + NP_2$ ----- $NP_1 + V \begin{matrix} act \\ pass \end{matrix} + NP_2$ (acc)

hypothesis IIb can be regarded as a special case of IIa. This means that if IIb can be falsified a forteriori IIa should be rejected as well.

Hypothesis III.

Hypothesis III, the final and preferred hypothesis, rests on the assumption that the incorrect application of the accusative marker in German is both restricted to passive sentences and in particular to the final position of these passive sentences. This assumption can be captured by the following rule:

III. X + V pass + NP ---- X + V pass + NP (acc)

This hypothetical rule is based on the notion that case markings occurring in the final part of a passive sentence tend to be determined exclusively on the basis of the deep structure relation action (as expressed through the transitive main verb) + patient (=NP). This relation is normally, as in active sentences, expressed as Verb + NP (accusative). The reasons why this regularity is confined to those NPs in the final part of passive sentences, will be dealt with later. In order to decide whether H.I or H.III is the better explanation, one needs to determine whether incorrect accusative cases are just as likely to occur with an NP as a surface structure subject of a passive sentence in sentence initial position as in sentence final position. Compare the following examples:

1 a. Der Schäferhund wurder gestern vor unserer Tür uberfahren.
1 b. Gestern wurde vor unserer Tür der Schäferhund uberfahren
1 c. Uberfahren wurde gestern vor unserer Tür der Schäferhund or:
2 a. Ein Apfelkuchen wird für ihn immer gebacken, wenn er nach Hause kommt.
2 b. Immer wenn er nach Hause kommt, wird für ihn ein Apfelkuchen gebacken.
2 c. Gebacken wird für ihn immer ein Apfelkuchen, wenn er nach Hause kommt

Of crucial importance in support of either hypothesis is the question of whether the subject of the sentences 1a and 2a are just as likely to be realized as an accusative as the subject in the sentences 1b, 1c, 2b, 2c.

In order to decide between hypothesis III and IIb, sentences of type NP + V + NP with the verb having either the active or the passive voice should be taken into consideration. If hypothesis IIb is true, there will be no difference in preference for the use of an accusative case with NP_2 in either NP_1 + V pass + NP_2 or NP_1 + V act + NP_2. If hypothesis III is true, a difference between both constructions can be expected, i.e. an incorrect accusative case is likely to be found in passive sentences. Furthermore, if hypothesis IIb has to be rejected a forteriori hypothesis IIa should be rejected as well because in IIa it is stated that in every sentence which fulfills the conditions of the structure X + V + NP the NP after the finite verb has the potential to be realized with an accusative case no matter what syntactic category X represents.

There is an error type which within all the observed case errors in passive sentences can be regarded as a subtype. The sentences of this type fullfill the conditions under which the incorrect rule of hypothesis III (as well as hypothesis IIb) could have been applied. Compare:

\+ 1a. Er wurde einen Verbrecher genannt
\+ b. Er wurder einen Feigling gescholten
\+ 2a. Er wurder als einen Verräter bezeichnet
\+ b. Er wurder als einen Freund betrachtet

In these examples, there is a specific action + patient relation that determines incorrect application of the accusative case with NP_2. Here the NP_2 is not the patient itself but a further specification of the patient, that normally has the same case marking as the NP to which it is related. Thus, there exists a relation of semantic and syntactic congruence between the NP (patient) and the NP (patient-specifier). NP_2 in the hypothetical rule of hypothesis III is therefore either the patient itself or an NP that functions as a further specification of the patient. From the examples (1a, 1b, 2a, 2b) mentioned above, it can be concluded that depending on the kind of verb that is involved, the NP (patient-spec.) can be preceded by als. In German, NPs with the function of patient-specifiers occur with verbs like: bezeichnen (als), ansehen (als), betrachten (als), meinen (als), nennen, heissen, schelten. The sentence type that is discussed here (especially with verbs like bezeichnen als etc.) is of crucial importance in order to accept either hypothesis IIb or III. Without this subtype it would not be possible to decide between these two hypothetical rules. For in German, there are no other passive constructions that can have an NP both before (i.e. in sentence initial position) as well as after (i.e. in sentence final position) the finite verb. +) Consequently, in order to be able to make a decision between hypothesis III and IIb it should be determined whether the incorrect accusative case is more likely to occur with the NP_2 in passive sentences such as

3. Dieser Politiker wird von vielen Leuten als ein Gegner des Fortschritts angesehen
4. Dieser Aufsatz wird in unserer Zeitschrift als ein Fehler bezeichnet.

as opposed to active sentences such as

5. Der Anwalt des Terroristen ist nur als ein schlechter Verteidiger aufgetreten.
6. Der ehemalige Präsident war unerwartet als der wichtigste Zeuge erschienen.

According to hypothesis IIb the construction $NP_1 + V + NP_2$ determines the accusative case with NP_2. This means that there will not be a preference for having an incorrect NP_2 (accusative) in (3) (+einen Gegner) and (4) (+einen Fehler) as opposed to (5) (+einen schlechten Verteidiger) and (6) (+den wichtigsten Zeugen).

If the hypothetical rule of hypothesis III is more likely to be applied, sentences like 3 and 4 will contain more case errors with NP_2 than sentences like 5 and 6. According to hypothesis III the NP_2 is more likely to have an incorrect accusative case in passive sentences (with a patient) than in active sentences in which the NP_2 functions as an agent. +) NPs within PPs can not be considered because in PPs case marking depends on the preposition that precedes the NP.

The explanation for hypothesis III.

The explanation for hypothesis I is clear: case marking in a passive sentence will take place on the basis of deep structure relations between the NP and the verb. In hypothesis II, accusative case marking should be explained relative to the place of the NP in the sentence. Any NP at the end of the sentence (either preceded by another NP or not) will be eligible for accusative case marking. The reason is that such an NP in active sentences is mostly a patient belonging to a transitive verb and therefore takes the accusative case. A faulty generalization of accusative case marking to all NPs in final sentence position also in passive sentences could be described in terms of hypothesis II.

What could be a possible explanation for hypothesis III? Why should an NP in the final part of especially passive sentences be a candidate for incorrect case marking? Kempens model of sentence production (1976, 1977a, b, c. 1978) could explain the facts as they are described in hypothesis III. This model of sentence production is based on the principle of partial parallellism. It should be distinguished from two other models for sentence production: serial alignment and strict parallellism. In a model that is based on the principle of strict parallellism, every semantic fragment that arrives will be immediately translated into a linguistic form and "no provisions are taken to guarantee syntactic coherence between the various sentence fragments that are uttered one after another." In the serial alignment model "sentence construction waits until the complete content is in." (Kempen 1977b, 110). However, experimental evidence (Kempen 1977b, 108ff; 1977c) has indicated that

(1) the input for the sentence construction process does not consist only of semantic structures.
(2) sentence production begins as soon as the speaker has made a decision with regard to a part (= the first) of the conceptual/ semantic elements (= partial parallellism).

The choice of the syntactic structure that expresses these semantic elements determines at least partially the syntactic structure of the rest of the sentence. As a result of this the semantic completion of the rest of the sentence is to a certain extent restricted by syntactic conditions.

According to Kempen's "realistic" (1976, 110) model of sentence production, which is based on the principle of partial parallellism, the sentence production process can already begin when the first semantic fragment is available to the sentence generator.

> "When a semantic fragment has become available, the sentence generator will immediately try to convert it into a piece of sentence while taking precautions which maximize syntactic coherence between successive parts of the sentence. This may imply interrupting sentence construction for a while until more semantic information has come in; this later semantic fragment may then very well be expressed earlier than its predecessors." (Kempen 1977b, 110)"... a semantic fragment arriving at the generator will be translated into a sentence fragment and overtly pronounced as soon as a syntactically coherent formulation has been found" (Kempen 1977b, 113)

Dependent on the theme, the conceptual structure, and the difference between given and new information, one semantic fragment will be chosen first. In the sentence production process, in German for example, it is likely that a semantic fragment will become available first. This first available semantic fragment will then be translated into an NP. As soon as a speaker starts his utterance in German with this NP, a case marker should be attached to this NP. It is obvious that this case marker will be the nominative case. If later on in the sentence generation process it turns out that this NP must be either the agent, patient or recipient of the action, this will determine the selection of the lexical items and the syntactic form of the rest of the sentence, i.e., the sentence fragment that is uttered first determines for a major part the syntactic structure and sometimes the selection of the lexical items as well. So, the underlying conceptual structure of the rest of the sentence should be translated - in one way or another - into a syntactic structure and lexical items which meet the restrictions and conditions that are associated with the first sentence fragment. In Kempen's model syntactic coherence is controlled by a monitor function.

> "the monitor controls the processes of conceptualizing (generating a to-be-expressed conceptual structure) and the syntactic structure formation (building the syntactic skeleton of the utterance). The monitor uses the central channel of attention." (Kempen 1977a, 8). "so the monitor keeps an eye on both the conceptualization process and the syntactic structure formation process. It receives the output of the conceptualizer, hands it over to the syntactic structure builder, and keeps track of any progress made by the latter. Also, the monitor may ask the conceptualizer to revise a conceptual structure so as to tune it better to current syntactic possibilities and desirabilities." The monitor sees to that "lexical selection is not only guided by conceptual information ("I need a lexical entry ex-

> pressing conceptual structure X") but also by syntactic requirements ("That lexical entry will have to fit in syntactic context Y"). (Kempen 1977a, 4)

The facts described in hypothesis III can be explained in terms of this model of sentence production in the following way:

(1) If it is the first part of the sentence, the NP can be expressed without any further conceptual information that is relevant to the rest of the sentence. This NP functioning as a surface structure subject (=nominative case in German) determines the selection of either an active or passive VP once the conceptual structure underlying this VP has been selected. In the cases that are described here the passive form has to be chosen because the subject NP is manifested as a patient within the conceptual structure of the rest of the sentence. This should explain why in sentences like 1a and 2a (p. 5) nominative case is always correct. The nominative NP determines the VP but the VP does not determine the nominative NP.

(2) If the initial position in the sentence is not occupied by an NP but by some other structure (i.e., an adverbial phrase), then the subject NP has to be selected in a later stage of the sentence production process. It is obvious that when this subject NP has to be expressed there will be more conceptual and/or lexical information available regarding the VP. However, for a correct application of the case marking, only the question of the selected voice of the previous verb (active or passive) is relevant. On the other hand, once a relation action-patient has been established on a conceptual level, there exists a specific problem for speakers of languages without a surface structure case system (i.e., English and Dutch). These speakers are inclined to express the patient in German on the surface structure level as an accusative, irrespective of the voice that has already been chosen. The reason for this violation of syntactic coherence is the fact that an NP in this conceptual structure normally (i.e., in the unmarked active form) should be realized as an accusative. Or stated in another way, the syntactic structure verb-NP (acc) expressing the conceptual/semantic structure action patient can be regarded as the most available one.

In Kempen's sentence production model, one part of the sentence production process will be carried out within the "central channel of attention." Another part will be carried out as "skilled behavior" which "doesn't need central attention capacity and consists of a set of 'demons' that take care of the detailed phonological shape of the words in the utterance. They operate in parellel, more or less independent of each other." (1977a, 1). And also "independent of the monitor" (1977a, 8). They are guided by syntactic features as voice and by the grammatical relations of the selected lexical items.

In the production of a passive sentence in German, the monitor should take care that the feature (passive) plays a role in the lexical insertion of the NP (=patient) when the morphological rules of case marking are applied. As previously described, this sentence production process can be disturbed in the first place by the fact that - for the conceptual structure action + patient - the lexicon contains a "syntactic construction" which has a more available "syntactic frame" than V (pass) + NP (nominative).

Or the monitor that is responsible for the syntactic coherence within the process of sentence generation, could have been functioning inappropriately. That is to say, at a certain moment during the sentence generation process the monitor has erased the syntactic information that is necessary to generate a sentence in the passive voice. In this case the most available syntactic structure V + NP (acc) will be selected. This can be regarded as due to a kind of L_1-interference. For an adequate expression of an NP in English as well as in Dutch - since both languages have no surface structure case system - it is not necessary to pay attention to the grammatical form of the V. Speakers of English and Dutch only have to take into account the semantic (and conceptual) relation NP-VP because of the different selection restrictions.

As a matter of fact, it seems plausible to suspect that an eventual erasure of the feature that specifies the voice of the sentence is likely to occur at the transition of the topic part to the focus part of the sentence.

The relevance of hypothesis III for explanations of L_2-errors

The explanations of hypothesis I and II for the case errors in the passive sentences of chapter II are essentially based upon differences between linguistic structures (contrastive analysis) as well as upon principles of (second) language learning.

Hypothesis III however requires an explanation which is fundamentally different from the ones that are usually presented. The fact is that it is impossible to find an explanation for hypothesis III in terms of a contrastive linguistic description even though it should be considered a part of psychology of second language learning. Therefore the central question is: why should the subject NP in passive sentences be provided with the incorrect accusative case marking especially at the end of the sentence where new information is introduced (i.e., the "given"-part). An explanation in terms of a contrastive linguistic description rests upon differences in linguistic rules and categories. However the NP (= patient that has case marking in German by not in English and Dutch can occur in German as well as in English and Dutch both in the initial (given) part of the sentence and in the final (new) part of the sentence. In this respect, there is no difference. There is also no difference in preference for either position. In the given part as well as in the new part the same problem of case marking exists. The only difference is in the case marking itself. Consequently there is from a contrastive analysis point of view no reason to suppose that case marking in the new part of a passive sentence would be more difficult than case marking in the given part. Likewise there is no possible explanation for hypothesis III in terms of a psychology of (second) language learning. Any speaker of an L_1 without a case system could acquire the German case system to some degree, but in terms of a psychology of second language learning, it is not possible to explain why the same distinction (nominative or accusative) is easier to acquire at the beginning of the sentence as opposed to the end of the sentence. The fact is that a certain distinction has to be learned and

that the acquisition of this distinction does not differ according to the place where it occurs in the sentence production process. This also means that an explanation of errors within a system of rules, usually referred to with the term interlanguage, can not capture the facts as they are described in hypothesis III. The reason is that the rules of an interlanguage system do not take into account specific factors of second language production. If it is true that certain L_2-errors are due to the rules of the language production system, than the rules of an interlanguage system are not able to account for these errors.

The explanation of errors (like those in chapter II) in terms of hypothesis III assumes that there can also be differences in certain parts of the language production mechanisms of L_1 and L_2. In this case it is a difference in the role of the monitor function (as described above) which accounts for these errors made by native speakers of English and Dutch.

Experiment one. Testing hypothesis II (=H.II) against hypothesis III (=H.III).

According to hypothesis II the order $NP_1 + V + NP_2$ is important for case marking in L_2=German as it is spoken by native speakers of English and Dutch. Within this hypothesis, the fact that in passive sentences case marking errors (accusative instead of nominative) are more likely to occur in the final part of the sentence is due exclusively to the position of NP_2 in the final part of the sentence regardless of the relation between predicate and NP_2; that is to say regardless of the voice of the sentence.

On the other hand, hypothesis III relates these case errors to the semantic relation between predicate (=action) and NP_2 (=patient). In order to allow a decision between H.II and H.III the test sentences should meet two conditions.

(1) The sentences should contain two NPs, one in sentence initial and one in sentence final position.

(2) The predicate should be varied for the factor voice. In one condition the predicate must appear in the active voice and in the other condition in the passive voice. This means for the sentences with an active predicate (=type a) there is a relation action-agent between the predicate and NP_2.

type (a): $NP_1 + Vact + NP_2$ (NP_2=agent)

type (p): $NP_1 + Vpas + NP_2$ (NP_2=patient)

H.II (=the null hypothesis) predicts no preference for the incorrect NP_2 (accusative) in either type (a) or type (p). However, H.III predicts a significant preference for an incorrect NP_2 (accusative) in type (p). Both hypotheses should be relevant for native speakers of an L_1 which don't have surface structure case systems like in German, for example English and Dutch, but have the deep structure categories agent and patient. For that reason native speakers of Dutch as well as English participated in the experiment.

Procedure

The following groups of subjects (students) participated in experiment one as well as in experiment two.
- Dutch university students (undergraduates) from the University of Nijmegen: 19 second year students and 24 third year students.
- American undergraduate and graduate students from UCLA: 24 students had three quarters (one quarter is 10 weeks) of formal instruction in German and 20 had more than three quarters of German as a second language. (Passive constructions are taught during the third quarter).

These subjects were asked to give their judgements on the grammaticality of the 108 different German sentences (see appendix B for the instruction. These sentences were presented on a memory drum in three series of five trial sentences + 36 test sentences. The order of the sentences within each series were counterbalanced. Of the 108 different test sentences 36 were relevant for experiment one, 44 for experiment two and 28 sentences were fillers (see appendix C).

In experiment one 18 sentences were of type (a) and 18 sentences were of type (p). The NP_2 in each type was provided with 9 instances of the correct nominative case as well as with 9 instances of the incorrect accusative case. In the NP_2 only masculine nouns could be used, because in German there is no formal distinction between the accusative and the nominative case both in feminine and neuter nouns. So in experiment one there were nine sentences of each type of the following four structures.

"type a-nom" : NP (nom) + V (act) + NP (nom)

"type a-acc" : NP (nom) + V (act) + NP (acc)

"type p-nom" : NP (nom) + V (pass) + NP (nom)

"type p-acc" : NP (nom) + V (pass) + NP (acc)

The following four sentences are examples of each type tested.

type a-nom: Der Anwalt des Terrorsten ist nur als ein schlechter aufgetreten.

type a-acc: Der ehemalige Präsident war unerwartet als den wichtigsten Zeugen aufgetreten.

type p-nom: Dieser Politiker wird von vielen Leuten als ein Gegner des Fortschritts angesehen.

type p-acc: Dieser Aufsatz wird in unserer Zeitschrift als einen Fehschlag bezeichnet.

The memory drum was connected with a digital counter. The counter was started each time that a sentence appeared in the aperture of the memory drum. The response button (incorrect, correct) was connected with the digital counter as well. Each time the subject pushed his/her response button the digital counter was stopped at the same time.

Between each test sentence the subject was given a blank on the memory drum. The following schema displays the predicates of the experimental sentences. They are listed according to the four different types in which they occur.

	type a.		(NP_2=agent)
NP_2 (nom)	ist (als ein NP_2)		aufgetreten
	ist	"	erschienen
	ist	"	hervorgetreten
	ist	"	hierhergekommen
	wird	"	sprechen
	darf	"	handeln
	ist	"	aufgetreten
	war	"	hereingekommen
	wird	"	regieren
NP_2 (acc)	ist (als einen NP_2)		erschienen
	war	"	weggelaufen
	ist	"	davongegangen
	ist	"	zurückgekehrt
	muss	"	auftreten
	wird	"	auftreten
	ist	"	angekommen
	ist	"	weggezogen
	wird	"	mitfahren
	type p.		(NP=patiens)
NP_2 (nom)	war (als ein NP_2)		hörbar
	war	"	zu sehen
	ist	"	bemerkbar

	type p. (continued)	(NP=patiens)
	ist (als ein NP_2)	zu verstehen
	wird "	angesehen
	möchte "	behandelt werden
	ist "	zugänglich
	ist "	gemeint
	wurde "	emfangen
NP (acc)	war (als einen NP_2)	verwendbar
	war "	zu verkaufen
	ist "	bemerkbar
	ist "	aufzufassen
	kann "	betrachtet werden
	wird "	bezeichnet
	ist "	erklärlich
	ist "	gedacht
	wurde "	erkannt

In testing H.II against H.III the crucial point is whether or not the semantic (or conceptual) relation: predicate (action) - NP (patient) effects case marking in German as a second language. Therefore type (p) does not only contain predicates in the passive voice like ansehen, behandeln, empfangen, betrachten, bezeichnen, erkennen but other predicates that express the same relationship as well. These predicates can formally be expressed by (a) ist + zu + infinitive, e.g. ist zu sehen, ist zu verstehen, ist zu verkaufen, ist aufzufassen, (b) adjectives which end in the morpheme -bar, e.g. hörbar, bemerkbar, verwendbar, (c) certain adjectives which end in the morpheme -lich, e.g. erklärlich, zugänglich, (d) predicates like ist gemeint and ist gedacht.

Results.

One important observation has to be considered in presenting the results of the experiment for the UCLA students. After participating in the experiment several students mentioned the fact that they had problems in judging case marking in the sentences with als (the sentences of experiment one), since they did not know how to deal with these constructions, many of them regarding als as a preposition which should

take the accusative case. (The accusative case was chosen because in German prepositions with a nominative case don't exist). But in order to make a decision between H.II and H.III we are not interested in the data of those subjects who are using this specific ad hoc strategy. Therefore these subjects were separated from those who already knew that the NP after als should be determined according to a relation of semantic and/or syntactic congruence between the NP_2 and NP_1.

It is relatively easy to separate both groups of UCLA students on the basis of their own responses. Subjects who treat als as a preposition and apply the rule als + NP (acc.) will show a high amount of incorrect responses regardless of the 4 sentence types. This is not the case with students who make their grammatical judgements on the basis of a relation of congruence between NP_2 and NP_1. In order to separate the subjects with the als + NP (acc.) strategy from the ones I am mainly interested in, the following criteria were used: subjects were considered to have applied the als + NP (acc.) strategy if they had (a) 13 or more errors in the sentence types a-acc. and p-acc. (out of a maximum of 18 possible errors) and (b) in the 9 sentences of type p-acc at most one error more than in the 9 sentences of type a-acc. Both types p-acc and a-acc play a central role in the application of these criteria. In criterion (a) the errors in both conditions are taken together and in criterion (b) the errors in one condition are compared to those in the other condition. The criteria were chosen in this way because it can be expected that subjects are inclined to abandon their strategy initially in those instances where the accusative case is not realized (correctly or incorrectly) in the test sentences: in the types a-nom and p-nom.

For the remaining group of UCLA students and for the K.U.N.* students as well it was assumed that they meet the preliminary requirement of determining the surface structure cases in German on the basis of a relation of congruence between NP_1 and NP_2. Thus within this group of subjects, who were considered not to have employed the als + NP(acc) strategy, it is theoretically possible to discriminate between three different subgroups:

(1) Those subjects whose grammaticality judgements are based upon the underlying semantic relation between predicate and NP_2,

(2) subjects whose grammaticality judgements are correctly based upon the surface structure relation of congruence between NP_1 and NP_2,

(3) subjects who seem to display random response behavior.

Since a group of native speakers of German was included as a control group, it is possible to compare the data of the four different groups of non-native speakers of German with the response behavior of this native speaker group as well.

* With an exception of one K.U.N. (2)-student, who according to the criteria mentioned above, should be assigned to the group of subjects who applied the als (=prep) + NP(acc) strategy.

The division of nonnative speakers of German into four different groups can theoretically be justified and related to specific criteria. These criteria can be formulated in terms of quantities of errors (= incorrect judgements), which can be expected in specific conditions. As mentioned above, there are four independent variables (= sentence types), and each variable contains 9 items (= 9 different sentences of a certain type).

sentences as they are presented / semantic function of NP_2	NP_2 = nom	NP_2 = acc
NP_2 = agent	type a-nom	type a-acc
NP_2 = patient	type p-nom	type p-acc

Group I.

This group is made up of subjects (mainly UCLA beginners) who treat als as a preposition, which governs the accusative case. For the reasons mentioned above, I used the following criteria:

a) total amount of errors in type a-acc. + type p-acc. > 13 (out of 18)

b) errors of type p-acc - errors of type a-acc < 1.

According to these criteria there are 18 UCLA students and 1 K.U.N. (2) student who belong to this group of subjects. For these subjects the reaction time data will not be analyzed.

Group II.

These are subjects whose grammaticality judgements are determined by the agent - patient distinction. That is to say, in the NP_2 = patient condition (i.e. type p-nom and type p-acc) there is a preference for the accusative case. The criteria are:

a) errors of type p-nom - errors of type a-nom > 5 and/or

b) errors of type p-acc - errors of type p-acc > 5

According to these criteria there are four UCLA students, 2 K.U.N. (2) students and four K.U.N. (3) students who belong to this group of subjects. For these subjects the reaction time data will not be subjected to further analysis. The preference for an accusative case in both NP_2 = patient conditions can be regarded as evidence for hypothesis III.

Group III.

This group consists of subjects, who generally come up with correct grammaticality judgements irrespective of the patient or agent condition. The criteria are:

a) errors of type a-nom + type p-nom < 7

b) errors of type a-acc + type p-acc < 7

c) errors of type p-nom - type a-nom < 4

d) errors of type p-acc - type a-acc < 4

According to these criteria there are 20 UCLA students, 15 K.U.N. (2) students and 20 K.U.N. (3) students who belong to this group of subjects. For this group the reaction time data as well as the grammaticality judgements will be analyzed.

Group IV.

These are subjects, who show random behavior in their grammaticality judgements. The criteria are:

a) 7 errors of type a-acc + type p-acc < 13.

b) errors of type p-acc - type a-acc < 13.

According to these criteria 2 UCLA students and 1 K.U.N. student belong to this category.

Group V.

This is the control group which consists of subjects who are native speakers of German.

In the following tables, the average reaction times, the total amount of errors, as well as the error averages is presented for the four different groups. Within group III a distinction can be made between UCLA students, K.U.N. (2) students, and K.U.N. (3) students.

Group I.: als (=presposition) + NP (accusative).

19 subjects:
18 UCLA
1 K.U.N (2)

r.t. = reaction time in milliseconds

sentences as they are presented / semantic function of NP_2	NP_2 = nom r.t.	NP_2 = nom errors tot.	NP_2 = nom errors av.	NP_2 = acc r.t.	NP_2 = acc errors tot.	NP_2 = acc errors av.
NP_2 = agent	8154	115	6.4	7235	147	8.2
NP_2 = patient	7632	113	6.3	7714	140	7.8

Group II.: agent --- nominative, patient --- accusative.
Since only those cases are included in which the errors of type p-nom - type a-nom and/or type p-acc - type a-acc both are 5 this means that the amount of subjects who contribute to the NP_2=nom types on the one hand and to the NP_2=acc type on the other are likely to be different. Three subjects are involved in the NP_2=nom.-type and seven subjects in the NP_2=acc.-type.

10 subjects:
4 UCLA
2 K.U.N. (2)
4 K.U.N. (3)

sentences as they are presented / semantic function of NP_2	(3 subjects) NP_2 = nom			(7 subjects) NP_2 = acc		
	r.t.	errors tot.	av.	r.t.	errors tot.	av.
NP_2 = agent	8230	1	.3	4699	3	.4
NP_2 = patient	8751	22	7.3	5175	47	6.7

Group III.: agent --- nominative, patient --- nominative.

UCLA
(20 subjects)

sentences as they are presented / semantic function of NP_2	NP_2 = norm			NP_2 = acc		
	r.t.	errors tot.	av.	r.t.	errors tot	av.
NP_2 = agent	6607	6	.4	6980	10	.7
NP_2 = patient	7952	11	.7	8092	21	1.4

K.U.N. (2)
(15 subjects)

sentences as they are presented / semantic function of NP_2	NP_2 = nom			NP_2 = acc		
	r.t.	errors tot.	av.	r.t.	errors tot.	av.
NP_2 = agent	4113	4	.3	4177	4	.3
NP_2 = patient	4529	13	.9	4979	24	1.6

K.U.N. (3) (20 subjects) sentences as they are presented

semantic function of NP_2	NP_2 = nom r.t.	errors tot.	errors av.	NP_2 = acc r.t.	errors tot.	errors av.
NP_2 = agent	3478	1	.1	3783	3	.2
NP_2 = patient	4018	12	.6	4313	24	1.2

Group V.: native speakers of German.

Germans (9 subjects) sentences as they are presented

semantic function of NP_2	NP_2 = nom r.t.	errors tot.	errors av.	NP_2 = acc r.t.	errors tot.	errors av.
NP_2 = agent	3864	0	0	3423	0	0
NP_2 = patient	3735	0	0	3777	2	.2

Group III.

For the reaction time data of group III it would have been appropriate to carry out an analysis of variance, but since I am mainly interested in the difference between the agent and patient condition I will confine myself to a test for the difference between the two means of a set of N paired observations.

For one subject the paired observation consists of the average reaction time, for the nine sentences of type a, either nom. or acc., as well as the average reaction time for the corresponding nine sentences of type p. The difference between any pair of reaction times (averaged over nine sentences) is D. The mean difference over all pairs ($\Sigma(D)/N$) is $\bar{D}$. For both sets of paired observations the 'difference method' will test whether or not $\bar{D}$ is significantly different from zero (Ferguson 1971, 153ff).

I. type p-nom versus type a-nom

	ΣD	ΣD^2	t	p
U.C.L.A. (20 subjects)	25.010	152.278	2.216	< .025
K.U.N. (2) (15 subjects)	6.244	4.525	4.348	< .0005

I. type p-nom versus type a-nom (continued)

	D	D^2	t	p
K.U.N. (3) (20 subjects)	10.794	11.444	4.438	< .0005

II. type p-acc versus type a-acc

	D	D^2	t	p
U.C.L.A. (20 subjects)	26.276	132.620	2.586	< .01
K.U.N. (2) (15 subjects)	12.034	14.057	5.541	< .0005
K.U.N. (3) (20 subjects)	12.633	11.592	6.479	< .0005

From the grammaticality judgements of group II (and group III as well, although to a lesser extent) and the analysis of the reaction times of group III it can be concluded that the correct (nominative) case is significantly more difficult to process in the NP_2=patient condition (= type p-nom and type p-acc) as opposed to the NP_2=agent condition (= type a-nom and type a-acc).

These results support hypothesis III which stated that the incorrect application of the accusative marker in German is both restricted to passive sentences and in particular to the final position of these passive sentences. Thus, hypothesis II which stated that the incorrect use of the accusative case in German is likely to be found in the final position of any sentence should be rejected.

Experiment 2.

Testing hypothesis I (H.I) against hypothesis III (H.III). According to H.I, incorrect case marking in passive sentences takes place on the basis of the deep structure or semantic relation between V and NP (patient). This means that an L_2-speaker of German who relies upon this semantic relation will mark the NP (patient) as an accusative no matter in which sentence position it occurs. H.III, however, claims that the semantic relation between V and NP (patient) leads to an incorrect case marking exactly in those cases where the NP (patient) occurs in the final (new) part of the passive sentence.*

In order to be able to make a decision between H.I and H.III, within the experiment the NP (patient) occurred in sentence initial position in half the test sentences, whereas in the other half, the NP (patient) appeared in sentence final position. H.I (the null hypothesis) predicts no preference for the incorrect NP (acc) in either sentence initial (given) or sentence final (new) position. However, H.III predicts a significant preference for an incorrect NP (acc) if it appears in sentence final position.

* It should be noted that as it was the case in experiment one, the word passive should be understood in a somewhat broader sense. This means that here the term passive also refers to sentences like (3) and (4) in

Procedure.

The subjects who participated in experiment one also participated in experiment two. Since the test sentences of experiment one were randomly incorporated with the test sentences of experiment two, the instructions were the same as in experiment one. In experiment two, the subjects were given 44 passive sentences. As previously mentioned, in one half of the test sentences the NP (patient) occurred in sentence initial position and in the other half in sentence final position. Furthermore, in half of the cases, the NP (patient) was preceded by a definite determiner (der/den, dieser/diesen, sein/seinen), whereas in the other half the NP (patient) was determiner (ein/einen). In addition, the NP (patient) was placed in main clauses (20) as well as in subordinate clauses (24). Finally, in half the sentences the NP (patient) occurred with the correct nominative case and in the other half with the incorrect accusative case. See the following table.

	nominative (2) (=correct)		accusative (22) (=incorrect)			
definite (2) (der/den, dieser/diesen, sein/seinen)	2	3	2	3	mainclause	
	3	3	3	3	subclause	(20)
indefinite (22) (ein/einen)	2	3	2	3	mainclause	(24)
	3	3	3	3	subclause	
	initial	final	initial	final		
	(22)		(22)			

The subjects had to judge if the masculine determiner that preceded the masculine noun had the correct case (accusative or nominative) or not. They were told that sometimes the same words were used in different test sentences, but that nevertheless these sentences were all different in both syntactic structure as well as in the use of correct and incorrect cases.* Consequently, every test sentence had to be judged independently.

The 44 test sentences were derived from the following 10 prototypes:**

* This is true except for the first 5 sentences of each of the three series which were used as trial sentences. They were repeated at the end of each series.

**When I did the experiment with American students taking a course in German at UCLA, I had to substitute a few words in order to accomodate the test-sentences to the level of proficiency of these students. This was mostly done by using a cognate word instead of the "normal" German word.

(1) Der Schaferhünd wurde gestern vor unserer Tur überfahren.
(2) Dieser Apfelkuchen wird für ihn immer gebacken, wenn er nach Hause kommt.
(3) Der Goldring fand sich bei der Durchsuchung im Gepäck des Fluggastes.
(4) Sein Standpunkt lässt sich an dieser Bemerkung ganz deutlich erkennen.
(5) Der Nachbar erzählte mir, dass der Apfelbaum in seinem Garten heute umgesägt wird.
(6) Dies war ein Mordanschlag, wobei der Täter nach der Verfolgung getötet worden war.
(7) Ich bin froh, dass der Streik trotz allen Erwartungen abgebrochen worden ist.
(8) Der Sekretär ist zuruckgetreten, weil sein Stellvertreter, wie er hörte entlassen worden war.
(9) Ich habe dies nur vorgeschlagen, damit der Vertrag zu jeder Zeit gelöst werden kann.
(10) Er wundert sich, dass der Antrag, wie man ihm mitteilt, abgelehnt wird.

In sentences (1) - (4) the NP (patient) is used in a main clause, in sentences (5) - (10), the NP (patient) appears in a subordinate clause. Although technically speaking sentences (3) and (4), which contain sich finden and sich lassen + V in the main clause are not passive sentences, they are yet comparable to 'real' passive sentences in that they both have an underlying action-patient relation which is expressed as VP + NP (subject).

Sentence types (3) - (10) were each used in four different conditions and sentence types (1) and (2) were each used in six different conditions. According to the different conditions, the NPs were presented in the following forms:

	Correct (=nom.)		Incorrect (=acc.)	
	initial	final	initial	final
Def. Maincl.	der Schaferhünd der Goldring	dieser Apfelkuchen sein Standpunkt der Schaferhünd	diesen Apfelkuchen seinen Standpuckt	den Schaferhünd den Goldring diesen Apfelkuchen
Def. Subcl.	der Apfelbaum der Vertrag sein Stellver- treter	der Täter der Streik der Antrag (Vorschlag)	den Täter den Streik den Antrag (Vorschlag)	den Apfelbaum den Vertrag seinen Stellvertreten
Indef. Maincl.	ein Apfelkuchen ein Goldring	ein Schäferhund ein Standpunkt ein Apfelkuchen	einen Schäferhund einen Standpunkt	einen Apfelkuchen einen Goldring einen Schäferhund
Indef. Subcl.	ein Apfelbaum ein Vertrag ein Stellver- treter	ein Täter ein Streik ein Antrag (Vorschlag)	einen Täter einen Streik einen Antrag (Vorschlag)	einen Apfelbaum einen Vertrag einen Stellvertreter

For the sentences (3) - (10) the four test sentences were constructed so that a certain noun with its determiner (either definite or indefinite) occurred in only one position (either initial or final) in only one form (either nominative or accusative). If a noun was used in one of both possible positions with one of both surface structure cases, this same noun was used in the other position with the other case. In doing so, there were no pairs of test sentences that only differ in respect to their case marking.

Results

Since there are no specific predictions with regard to the difference between main and subordinate clauses, these were not examined separately. However, both types of clauses were used in the test sentences in order to obtain a sizable number of sentences with different syntactic structures within one condition. The data were then analyzed according to the following schema.

	correct (=nominative)		incorrect (=accusative)	
	initial	final	initial	final
definite				
indefinite				

From the experimental data it appears necessary to divide all the subjects into two different groups. For group I the analysis of the reaction time data was most important, for group II only the judgements on the grammaticality of the experimental sentences was considered.

In the analysis of the reaction times of group I only those subjects who made twelve or fewer errors within the 44 test sentences were taken into account. In the following table it is shown how these subjects are distributed over the thirteen number-of-error categories.

number of errors	number of subjects	
	U.C.L.A.	K.U.N. (2)	K.U.N. (3)
0	9	1	4
1	3	1	5
2	2	1	3
3	1	1	2
4	2	5	2
5	2	0	4
6	4	3	0
7	2	1	0
8	0	1	1
9	0	1	0
10	1	1	0
11	1	0	0
12	1	0	0

As an additional condition for the evaluation of the reaction time data, these twelve or fewer errors had to have been more or less equally distributed over the eight different conditions. Therefore the following criterion was used: the number of errors in any condition ‘ 3.*

It was necessary to include both these conditions in order to be able to exclude a priori those subjects who might combine incorrect judgements and relatively fast reaction times in certain conditions with correct judgements and relatively slow reaction times in other conditions. The reaction times for the different sentence types are only then comparable if they are overall related to correct judgements.

On the other hand, for the subjects of group II who made relatively many errors, the data were examined to determine in which conditions these errors occurred. It could be expected that the subjects of group II would make relatively many errors in exactly those sentences for which the subjects of group I needed more time to get to a correct judgement.

Group I: reaction time data (in seconds).

U.C.L.A. (28 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
definite	6.364	6.635	6.889	6.942
indefinite	6.669	7.015	6.167	7.431

K.U.N. (2) (16 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
definite	3.846	4.301	4.228	4.249
indefinite	4.342	4.605	3.989	4.679

* Actually there are only four UCLA students (out of 28), three K.U.N. (2) students (out of 21) and 3 K.U.N. (3) students (out of 19) who have three errors in any condition.

K.U.N. (3) (21 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
definite	3.688	3.956	4.018	4.017
indefinite	3.955	4.160	3.848	4.212

Native Germans (9 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
definite	3.854	3.872	3.585	3.761
indefinite	4.542	4.209	3.317	3.847

From these results it can be concluded that for all L_2 speakers of German at least the factor initial/final plays a role. Whereas for native speakers of German only the factor definite/indefinite seems to be relevant. But the groups size of the native German subjects is still too small to obtain significant results. An analysis of variance will be carried out in order to find out the magnitude of these effects and their level of significance. Additionally, however, for the three groups of L_2=German speakers both within the condition 'correct' as well as within the condition 'incorrect' there is conformity as to which of the four types has the slowest reaction times and which has the fastest reaction times.

a) For the sentences with the correct (=nominative) case the fastest reaction times occur if the determiner is definite and in initial sentence position. Whereas the slowest reaction times occur if the determiner is indefinite and in sentence final position.

b) For the sentences with the incorrect (=accusative) case the fastest reaction times occur if the determiner is indefinite and in initial sentence position. Whereas the slowest reaction times occur if the determiner is indefinite and in sentence final position.

According to the difference test mentioned above, these differences are significant. See appendix D.

For the three groups of speakers of German as a foreign language (UCLA, K.U.N. (2), K.U.N. (3)) this seems to indicate that:

a) it is easiest to recognize a passive sentence as correct, with der, dieser, sein + N in sentence initial position and most difficult with ein + N in sentence final position.

b) it is easiest to recognize a passive sentence as incorrect, with einen + N in sentence initial position and most difficult, with einen + N in sentence final position.

These findings can be explained first of all on the basis of a language production model within which it is possible to account for the fact that an NP in passive sentences especially in sentence final position is eligible for an incorrect application of the accusative case. The main effects for the factor initial/final position can be regarded as evidence for this explanation. This means that H.I should be rejected in favor of H.III. In other words the predictions of H.III which are based upon the language production model as it is described above are consistent with the results of experiment two.

But besides the apparent main effects there is an interaction between the factor definite/indefinite and sentence initial/sentence final position. Within the condition correct the largest difference occurs between the sentences with der, diesen, sein + N in sentence initial position and ein + N in sentence final position and within the condition incorrect the largest differences occur between the sentences with einen + N in sentence initial and einen + N in sentence final position.

In addition to the psycholinguistic model of sentence production on which H.III is based, an adequate explanation of these results should also take into account (psycho) linguistic rules for the position of the definite and the indefinite NP in unmarked sentences. In an unmarked sentence (active or passive) in which a transitive verb occurs with two NPs, the first NP contains information with regard to the topic. The second NP contains information with regard to the focus. Since the topic normally relates to 'given' information, it is mostly definite. The focus part of the sentence normally contains new information (Chafe 1976) and is mostly indefinite. This is true for active as well as passive sentences. Hupet and Le Bouedec (1975), for example, found that adults prefer the following sentence (1) instead of (2) and sentence (3) instead of (4).

(1) I thought that the gangster had injured a policeman.
(2) I thought that a policeman had been injured by the gangster.
(3) I thought that the policeman had been injured by a gangster.
(4) I thought that a gangster had injured the policeman.

Now, it will be shown that the interactions within the conditions 'correct' as well as 'incorrect' can be adequately explained on the basis of both

(a) a psycholinguistic model of sentence production, in which the availability of certain semantic structure - surface structure relations is accounted for (=H.III),

(b) as well as on certain psycholinguistic rules for the position of the definite and the indefinite NP in an unmarked sentence.

The correct sentences

Der, dieser, sein + N in initial position is unmarked and ein + N in initial position is marked. For the correct sentences this explains

why der, dieser, sein + N in initial position is easier to recognize as correct compared to ein + N in the same position. In sentence final position the unmarked (but incorrect) einen + N can easily be regarded as correct, since the accusative case marking is more available and therefore more likely to be applied in sentence final position. Because a definite NP at the end of a sentence is marked, den, diesen, seinen + N doesn't come up as easily as a reasonable alternative for der, dieser, seinen + N instead of ein + N. So, einen as an alternative for ein is much more acceptable than den, diesen, seinen for der, dieser, sein. Therefore, a decision between einen and ein will require more time and/or lead to more incorrect judgements than a decision between den, diesen, seinen and der, dieser, sein.

The incorrect sentences

On the same theoretical basis it can be argued why the largest difference in reaction times is to be expected between the sentences with einen + N in initial position and einen + NP in final position. In sentence initial position the indefinite article is marked while the definite article is unmarked. This is the reason why it is easier to recognize (indefinite) einen + N in sentence initial position as incorrect as opposed to definite den, diesen, seinen + N in the same position. In sentence final position einen + N and den, diesen, seinen + N are both similar with respect to accusative case marking. This is the surface structure realization that can be considered as the one which is most available for an NP that functions as a patient. However, in sentence final position einen + N is unmarked and den, diesen, seinen + N is easier to recognize as incorrect that einen + NP.

Group II: grammaticality judgements (errors)

If we look at the judgements of the subjects who were excluded from the analysis of the reaction times, it becomes clear that we have to deal with a pattern that displays the same main effects and similar interactions as we obtained from the subjects whose reaction time data were analyzed. This means that for these students the judgement errors reflect the effect that was predicted according to H.III. On the other hand, the interaction between the factor initial/final position and the factor marked/unmarked seems to be operative as well, at least as far as the correct sentences are concerned. The following tables indicate the average amount of errors with a maximum of five.*

UCLA	Correct (=nom)		Incorrect (=acc)	
(16 subjects)	initial	final	initial	final
def.	2.0	2.2	2.6	3.4
indef	1.9	2.7	2.8	3.2

*The actual number of errors in final position was multiplied by 5/6, in order to obtain a figure that can be compared with the errors in initial position.

K.U.N. (2) (3 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
def.	.3	.6	.7	1.4
indef.	1.7	3.1	1.7	3.3

K.U.N. (3) (3 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
	.7	.6	2	1.4
	.7	.3	2.3	4.2

Total (22 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
def.	1.6	1.8	2.2	2.8
indef.	1.7	2.4	2.6	3.4

If we consider the subjects whose reaction time data were evaluated (=group I), the same pattern arises from their judgement errors.

UCLA (28 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
def.	.2	.2	.4	.5
indef.	.3	.7	.4	.6

K.U.N. (2) (16 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
def.	.1	.4	.5	.6
indef.	.1	.6	.3	.8

K.U.N. (3) (21 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
def.	.0	.2	.4	.5
indef.	.0	.6	.4	.7

Total (65 subjects)	Correct (=nom)		Incorrect (=acc)	
	initial	final	initial	final
def.	.1	.3	.4	.5
indef.	.2	.6	.4	.7

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Appendix A.

Nominative (=correct) and accusative (=incorrect) in passive sentences. Sentences written by Dutch students learning German as a second language. (The numbers refer to different subjects. In three, an active sentence with a correct accusative case has been included. Nine and ten are examples in which the predicate is semantically related to a passive construction.)

I. Main clauses.

1. - die Hauchstellung: der behauchte Anlaut oder Hauchlaut wird produziert.
   + - Es wird damit den Untershcied zwischen den Wörtern vereisen und verreisen angedeutet.
2. - Es wird ein Verschluss gebildet der gesprengt werden kann.
   + - Beim normalen Atmen wird keinen Gerausch erzeugt und auch keinen Laut.
3. - Sowohl die Stimmlippen als die Stellknörpel legen aneinander und bilder so einen Verschluss.
   + - Nur wird bei der Aussprache nur 1 Mal einen Verschluss gebildet.
4. - Bei der Erzeugnung des Glottisschlags wird der Verschluss gesprengt
   + - Durch diese entweichende Luft wird den zweiten Teil der Verbindungen gebildet.
5. + - In den aus Explosiv- und Nasalkonsonanten bestehenden Verbindungen (tn, pm, dn) wird den Verschlusslaut nich labial oder velar gelost aber faukal.
6. + - Es wird bei D. und B. einen Fall erwähnt, wo es Kaum anzunehmen wäre,...
7. + - In diesen drei Semantisierungsverfahrensweisen wird von der Muttersprache keinen Gebrauch gemacht.
   - Die Muttersprache wird als störender Faktor betrachtet.
8. + - Die Stimmlippen nähern sich, es wird keinen Stimmton gebildet.
   + - Es wird einen Stimmton, einen s.g. hörbaren Klang gebildet.
   + - Es wird keinen Stimmton gebildet. Die Lippen liegen aneinander.
   + - Es wird einen Verschluss im Kehlkopf gebildet.
9. + - Fur die zweite (=Variante) lasst sich einen ähnlichen Vergleich aufstellen.
10. - Die Stimmlippen liegen aneinander. Es kan also kein Stimmton erzeugt werden.
    + - Durch die Luft wird der Verschluss gesprengt und ist hörbar als einen Knall.
11. + - Im Extremfall kann (v) in dieser Position sogar als stimmhaften oder stimmlosen labiodentalen Verschlusslaut gebildet werden.

II. Subordinate clauses.

12. - die Verschluss-stellund: die Stellung der Lippen wobei sie einen Verschluss bilden (...)
    + - Die Zunge kann sich hoch, mittel oder tief im Mund befinden je nach dem welchen laut gesprochen wird.

13.+ - Die Stimmlippen nähern sich so dicht dass einen hörbaren Klang gebildet wird.
14.+ - Die Luft kann nur entweichen wenn den Verschluss gesprengt wird.
15.+ - (...) und wenn diesen Verschluss gesprengt wird, werden (...)
+ - (...) wird im selben Moment als der Verschluss des Explosivlaut gesprengt wird den Nasalkonsonant gebildet.
16. - Nachdem der Verschluss gesprengt worden ist, entweicht die Luft.
+ - Dies geschieht, indem einen Glottisschlag gebildet wird.

An example of a sentence written by an American student learning German as a foreign language:

16.+ - Es wurde vor Kerkhoff Hall einen Kunst ausstellen ausgestellt. Viele Künstler stellte seinen selbst gemachte Gemalde und Schmuck aus.

Appendix B.

Accusative or Nominative

INSTRUCTION

Since there is no case system in English, it is not always easy for us to use the different cases in German correctly. In this experiment you will be confronted with different German sentences. In these sentences the accusative and the nominative cases are used in the masculine gender i.e., der, dieser, ein or den, diesen, einen.

You should indicate if the case used in each particular sentence is correct or incorrect. For example:

Wir wollen sein Witz nicht anhoren (incorrect)
Diesen Bericht hat er uns heute zugeschickt (correct)
Diesen Mann wurde uns heute vorgestellt (incorrect)
Dies ist mein letzter Vorschlag (correct)

As soon as a sentence appears in the aperture of the "memory drum," you have to decide if the sentence is correct or incorrect. (incorrect is: incorrect accusative or incorrect nominative). As soon as you have decided whether a sentence is correct or incorrect, press the button to indicate your decision. At first there will appear several demonstration sentences and than we will begin with the actual test-sentences. Any questions?

Appendix C.

I. Test sentences from experiment one

The first nine sentence pairs were presented in the correct nominative case. The last nine sentence pairs were presented in the incorrect accusative case. The a-sentences contain predicates in the active voice, the p-sentences contain predicates in the passive voice or predicates that are semantically related to passive predicates. In the test sentences for the UCLA students, the NP's in brackets were used instead of the preceding NP's.

1a. Der Anwalt des Terroristen ist nur als ein schlechter Verteidiger aufgetreten.
1p. Der Schuss mit der Pistole war nur als ein dumpfer Knall (leiser Laut) hörbar.
2a. Der Professor ist hier zum ersten Mal als ein Politiker erschienen.
2p. Das Schiff war nur noch als ein kleiner Punkt zu sehen.
3a. Der Dichter ist in seinen Schriften als ein Kriegsgegner (Pazifist) hervorgetreten.
3p. Die Finanzlage (Dollarsituation) ist für die Wirtschaft als ein Ruckgang bemerkbar.
4a. Der Industrielle ist vor einigen Jahren als ein kleiner Geschäftsmann hierhergekommen.
4p. Diese Bemerkung ist doch vor allem als ein gutter Rat zu verstehen.
5a. Unser Vorsitzender (Präsident) wird in dieser Versammlung als ein Vertreter der Opposition sprechen.
5p. Dieser Politiker wird von vielen Leuten als ein Gegner des Fortschritts angesehen.
6a. Er darf in diesem Falle als unser Stellvertreter (Repräsentant) handeln.
6p. Er möchte vor allem als unser Wortfuhrer (Repräsentant) behandelt werden.
7a. Der Maler ist jetzt auch als ein Dichter in Erscheinung (auf-) getreten.
7p. Die Grabstätte (das Monument) ist erst seit kurzem als ein Wallfahrts- (Besuchs-) ort zuganglich.
8a. Der Attentäter (Angeklagte) war nach offizieller Angabe (offiziellem) Bericht als ein Besucher hereingekommen.
8p. Diese Bemerkung ist selbstverständlich nur als ein Vorschlag gemeint.
9a. Der General wird vermutlich als ein Diktator regieren.
9p. Der Präsident wurde offensichtlich als ein Wohltäter (Freund) empfangen.
10a. Der ehemalige Präsident war unerwartet als der wichtigste Zeuge (Gast) erschienen.
10p. Das verfallene Haus war nur noch als ein Abstellraum (Parkplatz) verwendbar.
11a. Der Betrüger war nach seinem Streich (Raub) als ein reicher Mann abgehauen (weggelaufen)
11p. Das Auto war nur noch als ein Haufen Schrott (altes Eisen) zu verkaufen.
12a. Der Unternehmer ist nach dem Streik als ein armer Mann davongegangen.
12p. Sein Tod ist für uns alle als ein grosser Verlust bemerkbar.
13a. Der Mann ist vor kurzem als ein Bettler zurückgekehrt.
13p. Das Konzept ist vor allem als ein Diskussionsbeitrag (Vorschlag) aufzufassen.

14a. Sein Neffe mus wieder als ein Retter auftreten.
14p. Sein Beitrag (Vorschlag) kann nur als ein Ansatz (Beginn) betrachtet werden.
15a. Mein Greund wird in dieser Angelegenheit (Sache) als mein Berater auftreten.
15p. Dieser Vortrag (Aufsatz) wird in unserer Zeitschrift als ein Fehlschlag (Fehler) bezeichnet.
16a. Der Tennisspieler ist bei uns als ein schlechter Verlierer angekommen.
16p. Seine Bemerkung ist mir nur als ein schlechter Scherz (Witz) erklärlich.
17a. Sein Vater ist vor 7 Jahren als ein Auswanderer weggezogen.
17p. Diese Zusage (Bejahung) ist selbstverständlich nur als ein erster Anstoss (Vorschlag) gedacht.
18a. Der Motorradfahrer wird bei dem Redrennen (Rennen) als ein Schrittmacher mitfahren.
18p. Der Sozialarbeiter wurde in dem Verhör (vor Gericht) als ein Rauschgifthändler entlarvt (erkannt).

II. Test sentences of experiment two.

Main clauses

definite:

1a. Der Schäferhund wurde gestern vor unserer Tür überfahren.
3a. Der Goldring fand sich bei der Durchsuchung im Gepäck des Fluggastes.
2a. Immer wenn er nach Hause kommt, wird für ihn dieser Apfelkuchen gebacken.
4a. Ganz deutlich lässt sich an dieser Bemerkung sein Standpunkt erkennen.
1b. Uberfahren wurde gestern vor unserer Tür der Schäferhund.
2b. +Diesen Apfelkuchen wird für ihn immer gebacken, wenn er nach Hause kommt.
4b. +Seinen Standpunkt lässt sich ganz deutlich an dieser Bemerkung erkennen.
1c. +Gestern wurde vor unserer Tür den Schäferhund Überfahren.
3b. +Bei der Durchsuchung fand sich im Gepäck des Fluggastes den Goldring.
2c. +Gebacken wird für ihn immer diesen Apfelkuchen, wenn er nach Hause kommt.

indefinite:

2d. Ein Apfelkuchen wird für ihn immer gebacken, wenn er nach Hause kommt.
3c. Ein Goldring fand sich bei der Durchsuchung im Gepäck des Fluggastes.
1d. Gestern wurde vor unserer Tür ein Schäferhund uberfahren.
4c. Ganz deutlich lässt sich an dieser Bemerkung ein Standpunkt erkennen.
2e. Gebacken wird für ihn immer ein Apfelkuchen, wenn er nach Hause kommt.
1e. +Einen Schäferhund wurde gestern vor unserer Tür überfahren.
4d. +Einen Standpunkt lässt sich ganz deutlich an dieser Bemerkung erkennen.
2f. +Immer wenn er nach Hause kommt, wird für ihn einen Apfelkuchen gebacken.
3d. +Bei der Durchsuchung fand sich im Gepäck des Fluggastes einen Goldring.
1f. +Uberfahren wurde gestern vor unserer Tür einen Schaferhund.

Subordinate Clauses.

definite:

5a. Der Nachbar erzählte mir, dass der Apfelbaum in seinem Garten heute umgesägt wird.

7a. Ich habe diese nur vorgeschlagen, damit der Vertrag zu jeder Zeit gelöst werden kann.
9a. Der Sekretär ist zurückgetreten, weil sein Stellvertreter, wie er hörte entlassen worden war.
6a. Dies war ein Mordanschlag, wobei nach der Verfolgung der Täter getötet worden war.
8a. Ich bin froh, dass trotz allen Ertwartungen der Streik abgebrochen worden ist.
10a. Er wundert sich, dass man ihm mitteilt, dass der Antrag abgelehnt wird.
6b. +Dies war ein Mordanschlag, wobei den Täter nach der Verfolgung getötet worden war.
8b. +Ich bin froh, dass den Streik trotz allen Erwartungen abgebrochen worden ist.
10b. +Er wundert sich, dass den Antrag, wie man ihm mitteilt, abgelehnt wird.
5b. +Der Nachbar erzählte mir, dass in seinem Garten heute den Apfelbaum umgesägt wird.
7b. +Ich habe dies nur vorgeschlagen, damit zu jeder Zeit den Vertrag gelöst werden kann.
9b. +Der sekretär ist zurückgetreten, weil er hörte, dass seinen Stellvertreter entlassen worden war.

indefinite:

5c. Der Nachbar erzählte mir, dass ein Apfelbaum in seinem Garten heute umgesägt wird.
7c. Ich habe dies nur vorgeschlagen, damit ein Vertrag zu jeder Zeit abgeschlossen werden kann.
9c. Der Sekretär ist zurückgetreten, weil ein Stellvertreter, wie er hörte, ernannt worden war.
6c. Dies war ein Mordanschlag, wobei einen Täter nach der Verfolgung getötet worden war.
8c. Ich bin froh, dass trotz allen Erwartungen ein Streik ausgerufen wird.
10c. Er wundert sich, dass man ihm mitteilt, dass ein Antrag gestellt wird.
6d. +Dies war ein Mordanschlag, wobei einen Täter nach der Verfolgung getötet worden war.
8d. +Ich bin froh, dass einen Streik trotz allen Erwartungen ausgerufen wird.
10d. +Er wundert sich, dass einen Antrag, wie man ihm mitteilt, gemacht wird.
5d. +Der Nachbar erzählte mir, dass in seinem Garten heute einen Apfelbaum umgesägt wird.
7d. +Ich have dies nur vorgeschlagen, damit zu jeder Zeit einen Vertrag abgeschlossen werden kann.
9d. +Der Sekretär ist zurückgetreten, weil er hörte, dass einen Stellvertreter ernannt worden war.

III. Filler sentences.

1. +Er erweist (zeigt) sich als einen Betrüger.
2. Er bekannte (zeigte) sich als der Übeltäter.
3. Als ein Fachmann hat er sich schon ausgewiesen (bekannt gemacht).

4. +Wie einen Betrunkenen hat er sich aufgeführt (benommen).
5. +Durch sein Auftreten in dieser Angelegenheit (Sache) macht er ein guter Eindruck
6. Einen Dummkopf hat der Lehrer den Schüler gennant.
7. Diesen Betrag werde ich dir demnachst (bald) überweisen.
8. +Ich werde dir sofort der Bericht zukommen lassen.
9. +Dieser Brief kann ich dir heute schon zuschicken.
10. +Ich kann dir der Zuschuss (Betrag) sofort überweisen.
11. +Ich habe ihn immer als ein Freund angesehen.
12. +Er begrusste mich als sein Freund.
13. +Ein Höhepunkt seines Schaffens stellt dieses Gemälde dar.
14. Sein Tod bedeutet für uns einen grossen Verlust.
15. +Das macht nur ein kleiner Unterschied aus.
16. Einen Kreis sollen die Kinder bei diesem Spiel bilden.
17. +Als der Sohn des Präsidenten bezeichnete er sich.
18. +Er präsentierte sich als ein Kenner des Werkes.
19. Als den Ehemann der beruhmten Sängerin stellte er sich vor.
20. Er zeigt sich allmahlich als einen grossen Staatsmann.
21. Diesen Fall werden wir demnachst noch einmal erwähnen.
22. Der Schriftsteller wird diesen Aufruf bald publizieren.
23. Der Abgeordnete hat den Verlauf der geheimen Sitzung verraten.
24. +Damit hat er versucht sein Mut zu erproben.
25. Es verschlug ihr den Atem bei soviel Grausamkeit.
26. Die Zeugenaussagen belasten den Verbrecher schwer.
27. Den Minister hat man jetzt endgultig kaltgestellt.
28. +Ein Wunsch von ihr hätte er nie missachtet.